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<b>16. Abstract (MAXIMUM 200 WORDS)</b>  This report describes the U.S. Coast Guard R&D Center's pilot survey and preliminary findings on the use of marine navigational aids (NavAids) in the Tampa Bay area of Florida. The Coast Guard R&D Center developed a web-based survey instrument to assess the navigational behaviors and preferences of NavAid users. Operators of commercial, public, military, and recreational vessels were solicited for their input by a pilot survey effort that was carried out during the summer of 2000. The preliminary findings indicate that mariners use nearly all navigational aids that are available to them. In general, as a mariner navigates from the open ocean to coastal areas, harbors and narrow channels, his/her reliance on NavAids progressively changes from radio aids like the Differential Global Positioning System (DGPS), to the Short Range Aids to Navigation, such as buoys and light structures, all provided by the U.S. Coast Guard. Inshore, mariners also rely on other NavAids such as geographic features and man-made structures. The results of the survey are used to assess the alignment of program services. Overall, the assessment revealed no clear areas of outdated or substantially misaligned services.			
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## **EXECUTIVE SUMMARY**

The United States Coast Guard (USCG) maintains short range (mostly visual) and long range (radio) aids to navigation that guide mariners to safe waters and away from hazards. Recent developments in radio navigation, as well as technological developments in electronic charting and navigation system integration, provide additional services to mariners. As part of its broader research into aid mix and waterway risk management, the USCG Research and Development Center (RDC) developed a web-based survey to help understand how mariners are actually using navigational aids. This survey sought to identify what navigation information is required by mariners and how they use aids to navigation, particularly various combinations of short range and radio aids, and other navigational aids to acquire this information and guide their vessels.

A pilot test of the survey was conducted in Tampa Bay, Florida during the summer of 2000. A total of 698 responses were collected from several major maritime population segments: Commercial, Public/Military, and Recreational Vessel Operators. The survey questions were designed to gain a better understanding of user preferences for, and actual use of navigational aids as a function area of operation, visibility, and user group. The results of the pilot study were used to develop findings concerning navigational aid use, an assessment of program service alignment with user needs, and suggestions for improving the overall survey process.

The preliminary findings indicate that Tampa Bay mariners state that they use nearly all navigational aids that are available to them, over the range of conditions and areas in which they navigate. Both NavAid preferences and usage patterns vary with user group, area of operation, and visibility. Global Positioning System (GPS) technology has been widely accepted by all groups except the Small Port-based Fishing and Charter group. More than half of the operators in this group continue to rely on LORAN as their primary radio aid to navigation. The use of Differential GPS (DGPS) by Large Commercial and Public/Military vessel operators is significant, but is limited to one third or less of the operators in all other user groups. However, mariners in all user groups cited buoys and lighted buoys, in addition to GPS/DGPS as their most preferred NavAids. The use of short range and radio aids varies significantly with the area of operation. As users progress from the open ocean, through the near coastal area to port, there is a general shift in preference from radio aids to mixed preference (combinations of radio and short range aids) to short range aids as the primary source of information.

One purpose of this study was to compare user needs as expressed through the survey responses, to current services delivered by the program. Overall, the assessment revealed no clear areas of outdated or substantially misaligned services, although the report discusses some ideas for future program alignment, and the need for continued monitoring of user needs in an environment of rapidly changing technology.

As a result of this pilot study using the prototype survey instrument, several shortcomings in the overall survey process were identified: 1. lack of total population figures for the various user groups in the survey area; 2. small sample size for four of the six user groups; and 3. prototype survey questions need further development. These and other factors limit the validity of the

findings drawn from the survey data. The specific findings in this report are therefore based on trends and patterns observed in the data, which nonetheless provide some sense of mariners' preferences for, and use of, marine navigational aids.

The web-based AtoN User Survey instrument provides a prototype tool for gathering information to help understand mariners' needs for navigational aids. However, the results obtained in any single port may not be representative of NavAid preferences and use nationally. Experience suggests that there are five somewhat distinct areas in the country (Atlantic, Pacific, Gulf, Great Lakes and Western Rivers) that would require sampling to gather enough information to assemble a national picture.